

## University of Windsor Scholarship at UWindsor

---

OSSA Conference Archive

OSSA 8

---

Jun 3rd, 9:00 AM - Jun 6th, 5:00 PM

# Commentary on Novani

Brian Macpherson

Follow this and additional works at: <http://scholar.uwindsor.ca/ossaarchive>



Part of the [Philosophy Commons](#)

---

Brian Macpherson, "Commentary on Novani" (June 3, 2009). *OSSA Conference Archive*. Paper 117.  
<http://scholar.uwindsor.ca/ossaarchive/OSSA8/papersandcommentaries/117>

This Commentary is brought to you for free and open access by the Faculty of Arts, Humanities and Social Sciences at Scholarship at UWindsor. It has been accepted for inclusion in OSSA Conference Archive by an authorized administrator of Scholarship at UWindsor. For more information, please contact [scholarship@uwindsor.ca](mailto:scholarship@uwindsor.ca).

# Commentary on Sergio Novani's "An Argument-Operational-Conjectural Approach in Criminal Trials"

BRIAN MACPHERSON

*Department of Philosophy  
University of Windsor  
Windsor, ON  
Canada  
macphe4@uwindsor.ca*

## 1. INTRODUCTION

In his paper "An Argument-Operational-Conjectural Approach in Criminal Trials," Professor Novani argues that a judge or jury in criminal trial deliberations must avoid blindly relying on scientific evidence or expert testimony alone without critical reflection on that evidence, that is, reasonable doubt. Reaching a decision beyond reasonable doubt involves putting questions to expert witnesses and cross-examining them. Further, all terms used in the expert testimony should be clearly defined thus resulting in a "translation" of the testimony into something more understandable, followed by a second critical examination of the translated testimony. Only after a process of deliberation as outlined above has been conducted should a verdict be passed by judge or jury. While I am in agreement with Professor Novani that criminal trial deliberations should involve critical examination of the evidence rather than being blindly led by it, I am not so sure about some of the examples he uses to illustrate this point.

## 2. UNDERESTIMATING THE IMPORTANCE OF PROBABILITY IN LEGAL REASONING

In one example from Professor Novani's paper, the prosecutor argues—based on expert testimony—that there is a DNA match found at the crime scene where the chances of a match are 10 out of 10,000,000. From this, the prosecutor infers that the probability of the defendant's being innocent given a match are 10 out of 10,000,000. Professor Novani then argues that what the prosecutor overlooks is that given the match, the probability of innocence is really 9 out of 10 (or the probability of guilt is only 1 out of 10). The idea here is that before critical reflection on the evidence, it would appear that the chances of innocence are miniscule—10 out of 10,000,000—whereas after reflection on the data, the chance of innocence is actually 9 out of 10.

The problem with the way this example is presented is that the probability of the defendant's DNA matching the DNA found at the crime scene—10 out of 10,000,000—is ignored or discounted. However, it needs to be factored in to calculate the probability that the defendant is innocent. The event the judge or jury needs to consider is actually a

complex conjunctive event, viz., the defendant's DNA matching *and* the defendant's not having committed the crime. To calculate the probability of this conjunctive event using classical probability theory, we would need to use the multiplication rule.

$$P(\text{DNA match}) = 1 \times 10^{-6}$$

$$P(\text{not committing the crime/DNA match}) = 9 \times 10^{-1}$$

$$P(\text{DNA match and not committing the crime}) = P(\text{DNA match}) \times P[\text{not committing the crime/DNA match}] = (1 \times 10^{-6}) \times (9 \times 10^{-1}) = 9 \times 10^{-7} \text{ or } 0.0000009$$

Thus, the probability of the defendant's DNA matching and not having committed the crime is .0000009, and so the probability of innocence is 0.0000009 and not 0.9. Assuming the expert testimony regarding the DNA match is reliable, then the probability of the defendant's being innocent is only 0.0000009. In the absence of any other suspects or reasons to doubt the testimony of the expert witness, there is good reason to suspect guilt in such a case.

With this said, I will grant that Professor Novani makes an important point. The judge or jury must critically evaluate the evidence before making an inference resulting in a conviction. For example, was there tampering of the evidence, was there contamination of the DNA, and so forth. Also, is the laboratory that carried out the testing reliable, and does it have a good track record? Another important concern is whether other companies performed the tests and had similar results. These are legitimate questions that ought to be considered before a decision to convict is made. Nonetheless, the odds of a DNA match but not committing the crime—0.0000009—gives pause for concern.

In the same vein, recall the O.J. Simpson murder case in the United States. Using DNA matching, it was found that blood discovered at the murder scene matched O.J.'s blood. Experts testified that the odds of Simpson's blood matching the blood at the murder scene were 1 in 170,000,000. [1] In addition, a pair of bloody socks found in Simpson's bedroom had blood that according to DNA testing matched the blood of Nicole Simpsons. The probability of a match without it being Nicole Simpson's blood was estimated to be 1 in 9.7 billion. [1] Now, consider the probability of the complex conjunctive event A, Simpsons' blood matching the blood at the murder scene without his having been there *and* B, Nicole Simpson's blood matching the blood on O.J.'s sock without it being her blood. Ignoring conditional probabilities for the moment, the probability of this conjunctive event is as follows:

$$P(A \text{ and } B) = P(A) \times P(B) = (1.7 \times 10^{-8}) \times (9.7 \times 10^{-9}) = 1.65 \times 10^{-18}$$

That is, the probability of this conjunctive event is 0.000000000000000000165. Once again, this probability should give pause for concern. To be fair, there was evidence in the Simpson case of evidence tampering and there was some question as to whether or not the DNA had been contaminated. However, were these reservations sufficient to justify reasonable doubt? This is a matter to be resolved by legal experts. The probability of finding Simpson at a golf course after his acquittal was quite high, no doubt.

Finally, the case of Sally Clark was cited by Professor Novani as another example involving flawed legal reasoning. As Novani notes, Sally Clark was accused of killing her

## COMMENTARY ON SERGIO NOVANI

first child at 11 weeks and then of conceiving another child and killing that child at 8 weeks. It was found that the odds of both children having died from SIDS was 1 out of 73,000,000, i.e.,  $7.3 \times 10^{-7}$ . On the basis of this probability, the prosecution argued for conviction. Novani's criticism of the prosecution's reasoning is that this probability was not compared with the probability of a mother killing a child, conceiving another one, and then killing it. That is, a proper context or background was needed to evaluate the significance of the probability of two children dying from SIDS in the same family.

While I am sympathetic to Novani's reservations, surely the probability of someone serially killing two of their children is quite low. If the probability of someone doing this is *higher* than the probability of two children dying of SIDS in the same family then it would be more likely that Clark killed her children than that they both died from SIDS. So such a strategy could well backfire on the defense. Granted, if the probability of two children in the same family dying of SIDS is roughly the same as the probability of a parent killing them both, then giving the defendant the benefit of the doubt, more evidence would need to be presented—such as a history of violence or mental instability—to reach a conviction. If the probability of two children in the same family dying of SIDS is more likely than a parent killing them both, then once again, more evidence would need to be presented for a conviction.

### 3. CONCLUSION

My overall point is that Professor Novani is perhaps underestimating the power of statistical evidence and probability in criminal trials. If your DNA is found at a crime scene and the odds of that happening are 10 out of 10,000,000 then the prosecution has a strong case pending contrary evidence.

[Link to paper](#)

### REFERENCE

*en.wikipedia.org/wiki/O.\_J.\_Simpson\_murder\_case*